

Digital knowledge, obsessive computing, short-termism and need for a negentropic Web

Bernard Stiegler

Bernard Stiegler is one of the most inspiring and important continental thinkers of today, an heir to Nietzsche, Husserl, Heidegger, Foucault and Derrida, but also to Simondon and Adorno. He is best known for his three volume *Technics and Time* on technology and memory (in English 1998, 2009, 2010) but also for his other philosophical and political interventions in contemporary culture such as *States of Shock: Stupidity and Knowledge in the 21st Century* (Engl.2015), *What Makes Life Worth Living: On Pharmacology* (Engl. 2013), *For a New Critique of Political Economy* (Engl. 2010). With his new series *Automatic Society* (the English edition of part 1 *The Future of Work* will be released in the Summer of 2016) Stiegler systematically explores the social implications of digital technologies. Stiegler is the Director of the Department of Cultural Development at the Centre Georges-Pompidou and the founder of Ars Industrialis, a political and cultural group

advocating an “industrial economy of spirit” against the short-termism of capitalist consumer culture. In 2010 he started his own philosophy school in the small French town of Épineuil-le-Fleuriel open for lycée students in the region and doctoral students from all over France.

Bernard speaks about digital tertiary retention and the need for an epistemological revolution as well as new forms of doctoral studies and discusses the practice of ‘contributive categorization,’ the ‘organology of transindividuation,’ ‘transindividuation of knowledge’ and individuation as negentropic activity. He calls for an ‘economy of de-proletarianization’ as an economy of care, compares the impact of the digital on the brain with heroin and expects the reorganization of the digital from the long-term civilization in the East.

Media Literacy

Roberto Simanowski: In his pageant play *The Rock* (1934) T.S. Eliot writes: “Where is the Life we have lost in living? / Where is the wisdom we have lost in knowledge? / Where is the knowledge we have lost in information?” These critical questions resonate with a common thread in many of your texts regarding the evacuation of knowledge (*connaissance*) and know-how (*savoir-faire*), and the substitution of *savoir vivre* by ability to consume. Eliot’s complaint is informed by what Nietzsche called the death of God and Weber termed the disenchantment of the world. The next lines in the Eliot passage read: “The cycles of Heaven in twenty centuries / Bring us farther from God and nearer to the Dust.” God is no criterion in your writing, dust somehow is. Rather than a return to religion you advertise a return to the critique of political economy and a re-reading of poststructuralism and its sources, Hegel and Marx. Schools and universities as institutions where knowledge is taught and reason is formed play an important role in this regard. However, these institutions are at war with old and new media for attention as you discuss in your

new English book *States of Shock: Stupidity and Knowledge in the 21st Century*. Lets start with a very simple question: If you were the minister of education, what would be your first instruction?

Bernard Stiegler: First I would say, I need to become also the minister of science and research. Because first you have to change the way in which science is produced and the objects of science themselves. The problem is what I call tertiary retention and especially its new form: digital tertiary retention. Digital tertiary retention is transforming the conditions not only of the transmission of knowledge, but also of its elaboration and the tradition of scientific objects. All knowledge, including everyday life knowledge, what in French is called *savoir vivre*, as well as practical knowledge, *savoir-faire*, is now transformed by digitalization. I think that this is an enormous transformation for which a new organization of academic knowledge is needed. More practically, more precisely, it necessitates the creation of new forms of doctoral schools, new forms of high-level research.

RS: Tertiary retention is your term to describe exteriorization of long-term memory in mnemo-technical systems such as archives, libraries or even oral lore. How do you apply this to the digital?

BS: The way in which we create new theories and theoretical objects is conditioned by our instruments. Knowledge, particularly academic knowledge, is always conditioned by what I call the literal tertiary retention in the case of the knowledge of the West, for example the alphabet and writing as the condition of the possibility of apodictic geometry in the sense of Husserl. Today we have objects, biological, mathematical, physical, nanotechno-physical objects. Actually, every kind of object is produced by digital means that are not means in reality but are in fact the element of knowledge in the sense of Hegel: its new milieu. Therefore it is absolutely necessary to develop new forms of doctoral studies, which will not only produce new objects of knowledge but new instruments for producing rational objects.

RS: Given the agenda of your book *Digital Studies: Organologie des savoirs et technologies de la connaissance* of 2014 I take it that

you are not talking about digital technologies as new instruments of knowledge production in the sense of Digital Humanities.

BS: What I mean is not Digital Humanities which considers digital instruments in a classical way. What I mean is digital studies which is very different. The question for people who use digital means for analyzing archives for history for example or archeology does not really changes their views on what is death, what is the role of linguistics etc. For me, to study digital text is to necessarily completely reconsider what language is - once digitized. It is also questioning what is the relationship between language and writing, how writing modified the evolution of language, made possible linguistics for example etc. What we need is an epistemological revolution.

RS: What does such an epistemological revolution look like?

BS: A laptop, a computer, is a device, an apparatus to produce categories or categorization through algorithms. The basis of the theory of knowledge for Aristotle is the question of categorization. What is happening with digitization is an enormous transformation of the basis of knowledge. And I think this needs a complete reconsideration of what is knowledge as such. I myself practice with my students what I call contributive categorization exploring what is the process of categorization for Aristotle but also by practicing the process of categorization with data.

The other important aspect is destruction: Innovation goes much more quickly now and knowledge arrives always too late. Not only in the sense of Hegel saying that Minerva is flying in the evening and that philosophy is always too late. We have today a transformation of technical milieu that goes extremely quickly and we need to practice the transindividuation of knowledge in a new way. To that end, we have to develop a contributive research that is based on the use of those processes of contributive categorization but that are also processes of contributive certification based on hermeneutic communities, realizing in such a way the method of what Kurt Lewin called "action research" where you can involve many people in a team who are not necessary academics but interested in the team's object: your own

students but also, in PHD programs based on such a contributive research, forming communities of hermeneutic and networked action research

RS: Transindividuation is a central concept in your writing, one that is inspired by the philosopher Gilbert Simondon and aims at co-individuation within a preindividuated milieu. Individuation itself is an omnipresent and continuous transformation of the individual by information, knowledge, and tertiary retention, which is often carried out through the encounter with books, and nowadays increasingly through engagement with digital media. Transindividuation is the basis for all kinds of social transformation and is certainly vital to “action research” and “hermeneutic communities”. Your notion of hermeneutic communities and the transindividuation of knowledge reminds me of Pierre Lévy’s 1994 book *L’intelligence collective: Pour une anthropologie du cyberspace* and other concepts of knowledge production from below on the Internet as a kind of democratization of knowledge. Wikipedia is one example, the quantified self movement is another one. I also think of your discussion of the transindividuation of memory as a way to overcome the global and quotidian “mercantile production of memory”. What role do you think the Internet and especially Web 2.0 can play in terms of the transindividuation of memory and knowledge?

BS: Knowledge itself is a process of transindividuation as it is based on controversy, on conflicts of interpretation, on processes of certification by critical means, by peer to peer critique. This was the basis for the Web in the beginning. At the beginning the Web was based on the process of transindividuation. But the Web was so successful immediately that the question was how shall we create data centers for being able to satisfy this traffic. This became a problem of investment, an industrial question in the sense of economics, industrial economy. This deeply modified the functioning of the Web itself. I know this also because I worked with the WWW Consortium. There was an enormous lobby by Silicon Valley for completely transforming the data format into computable formats dedicated to data economy, dedicated to

computation. Today the platforms, the social networks and services like Amazon, Google or Facebook are only dedicated to the computation of and on data. This was not the role of the Web at the beginning. At the beginning the role of the Web was to track and trace and to make formalized, searchable and then comparable the singularities of the people producing webpages etc. So I think we need a reinvention of the Web.

RS: On the reinvention of the Web I would like to hear more in a moment. First I want to put knowledge, tertiary retention, and transindividuation into a broader political context. In your book *For a New Critique of Political Economy* you write: „The consumerist model has reached its limits because it has become systematically short-termist, because it has given rise to a *systemic stupidity* that *structurally prevents the reconstitution of a long-term horizon*.“ Stupidity and the lack of courage or desire to use one's own understanding have been addressed in the Enlightenment and later by Critical Theory. Famous in this regard is Adorno's claim that amusement promises a liberation from thinking as negation. Your critique of the commodification of culture seems to return to both Adorno's severe critique of distraction and the Enlightenment's call to emergence from one's self-incurred immaturity. What has changed — since Adorno and after the Web 2.0 seems to have fulfilled Brecht's famous media utopia (with regard to radio) of putting a microphone in each listener's hand?

BS: The question is the pharmacology of the Web. I work a lot with Adorno and particularly on this question. But my problem with Adorno is that he couldn't understand that if he was to address these questions with reference to the Enlightenment he must transform the Kantian heritage concerning what Kant calls schematism and transcendental imagination. I have tried to show in *Technique and Time 3* that it is impossible to continue to follow Immanuel Kant on this question of precisely the process of categorization of the concepts of the understanding as a transcendental grip. It is not at all a transcendental grip but is produced by tertiary retentions. And this is the reason why we need to completely redefine the theory of categorization for today.

Not only with Aristotle but also with Kant. Moreover we have to pass through the theories of symbolic time by Ernst Cassirer and also by Durkheim explaining that categorization is produced for example in shamanic society through the totem.

This is the first question. The second question is how to deal with the pharmakon. If you don't use the pharmakon to produce therapies it will necessarily be a poison. To say we have completely to redefine education and put students not into the grammar school but in front of a computer, is wrong. I am absolutely opposed to the notion that the digital must become the first priority of education. Children should first be absolutely versed in grammar and orthography before they deal with computation. Education in school should follow the historical order of alteration of media, i.e. you begin with drawing, continue with writing, you go on to photography, for example, and then you use the computer which would not be before students are 15 or 16.

So the point is not to make all children use a computer but to make them understand what a computer is, which is completely different. If we don't create a new education the practice of the market will rule like the practices of a dealer. In a way the digital is as strong as heroin is for the brain. It has exactly the same effect on society as heroin has on the brain. When you use heroin or opium the capacity of your brain to produce endorphins decreases and there is a moment when you become completely dependent on its intoxication, and have no other way than using heroin. Now we are in such a situation with the digital tertiary retention. The reason is we don't know how to cap it, this pharmakon. It is prescribed by sellers of services, the dealers of digital technology. I don't mean to be providing a moral judgment here, but a purely pharmacological analysis. The problem is not that Google or other big Internet-companies have bad intentions but that we, the academics, don't make it our job to produce a digital pharmacology and organology.

RS: Your call to produce a digital organology reminds me of your notions on how music apparatuses such as the phonograph or radio have created a short-circuit in musical skills. Being able

to play music should be a precondition for significant skill when listening to music. The obvious link to the digital would be that we don't understand the digital if we don't understand its apparatuses, i.e. operating systems, programs, applications. As you point out, before we acquire such understanding we have to be able to master reading and writing. This, however, seems to be jeopardized by the digital apparatuses which undermine the organology of transindividuation within book culture by compromising lasting attention, deep reading and complex thinking. In your book *Taking Care of Youth and the Generations* you refer to the neuroscientist Maryanne Wolf who holds that we are not born to read but have to undergo a cerebral rearrangement in order to achieve the skills of reading and writing, a cerebral rearrangement which is, as Wolf and others hold, nowadays jeopardized by digital media. In a later text, on *Web-Philosophy*, you cite Wolf's concern as a mother asking herself how the digital brain will be able to grow and withstand digital technologies without negative effects. You conclude: "If bodies like the World Wide Web Consortium do not take on this kind of question, these organizations cannot reach very far." What is it such institutional bodies could do but don't? And how can they help to reinvent the Web?

BS: I think they should produce negentropy. Now, the problem of negentropy is always the production of singularity. If you are to manage a huge flux of data through algorithms, that are automatic computations, you need to process a comparison between singularities to make them analyzable and understandable, and you transform this singularities into particularities. A singularity is self defined, and a particularity is defined by a set of which it is a part. Computation necessarily transforms singularities into particularities of such a set. Using digital technologies, you have to deal between negentropy and entropy or, to say it with Saussure and structuralism, between diachrony and synchrony. In the theory of systems, diachrony is the dynamic tendency that makes dynamic the system, and synchrony is another tendency that maintains the system meta-stable. I believe that it is today absolutely possible and necessary to redefine the architecture of

the networks creating algorithms and big data dedicated to the traceability of singularities and to put these singularities into hermeneutic communities for creating dynamic communities of knowledge -with technologies for annotation, new types of data analysis algorithms and new kinds of social networks.

RS: Negentropy, i.e. negative entropy, can be understood as the export of entropy by a system in order to keep its own entropy low. You consider individuation as a negentropic activity. How would the Web achieve this?

BS: The Web is producing entropy not only in the sense of thermodynamics, but in the sense of information theory, cybernetics, theory of complex systems and what I call now nequanthropology. The Web is completely subject to computation and automation based only on computation. Now, through interactions with the practitioners of the web, helped by algorithms like bots on Wikipedia, these practitioners created negentropy - that I call also noodiversity. This is what is destroyed by the data economy, only based on computation. The question for the future, not only for the Web, but for human kind is to produce negentropy. The problem of climate change for example is a problem of increasing entropy. It is possible to create new systems dedicated to reduce the automata of algorithms for giving people the possibilities to trace, confront and co-individuate their differences, their singularities. I am working on a new theory of social networking not based on the network effect but based on the theory of collective individuation. The problem is not dedicated to a short-termist market but based on a long-term economy capable of producing a new type of development based on an economy of negentropy.

Politics and Government

RS: Let me respond to the issue of long-term economy and negentropy and the overdue transition from the Anthropocene or *Entropocene*, as you put it, into a new “general ecology” or, as you call it, *Neganthropocene*. In many of your texts you underline the destructive nature of the globalized industrial system, warning, as in your book *What Makes Life Worth Living: On Pharmacology*

(2013, French 2010), that “it is the future of terrestrial life that is at stake with unprecedented urgency” and calling for a “peaceful growth and development”. Degrowth – which was first discussed in the 1979 book *Demain la Décroissance: Entropie-écologie-économie* by Nicholas Georgescu-Roegen, Jacques Grinevald, and Ivo Rens – is an imperative in many alternative, ecological economies today as for example the title of Serge Latouche’s 2009 book *Farewell to Growth* indicates. However, when the German philosopher Hans Jonas, in his 1979 book *The Imperative of Responsibility: In Search of an Ethics for the Technological Age* entertains the same idea, he assumes that the rather unpopular concept of non-growth can only be implemented by a government that does not rely on its constituencies’ approval. Ironically, this would, as Jonas notes, turn all the hope to totalitarian countries such as China or even Russia who today, however, are far away from compromising economic growth on behalf of ecological concerns. In this context it is remarkable that today governments in democratic countries such as Germany give themselves what they call a *Digital Agenda* in order to govern the development of digital media and its ramifications in society. This *Agenda* also addresses the risks and threats associated with the process of digitization such as privacy, dataveillance, as well as pattern recognition and prediction (and hence manipulation) of individual behavior through big data mining. It may come as little surprise that businessmen, such as the chairman of the German Federal Association for Information Technology, Telecommunications and New Media, criticize the high data protection regulations set by the government as a hindrance for new business models and Germany’s success in the digital revolution and warn that we must not apply the rules of the analog world one to one in the digital economy but should review the concept of data thriftiness and become more daring. With respect to growth concerning industry 4.0 and with respect to what has been called data pollution one could say, while the government implements negentropic regulations, the business world rejects any interventions and calls for entropic freedom.

BS: Let me first answer the question about growth and de-growth. I disagree with the concept of de-growth. The problem is not growth as entropy. It is not possible to de-growth. What do we mean by growth? The definition of growth by Keynes is absolutely partial and insufficient if not contradictory - particularly with respect to his essay *Economic possibilities for our grandchildren* of 1931. This is also the reason for which I follow today Amartya Sen and his new type of indicators for what growth is. He doesn't call this growth, he calls it human development. The problem is the development of what he calls "capacitation" and what I call myself knowledge. The problem is proletarianization. We need an economy of de-proletarianization which is also an economy of care. Because knowledge is a type of care. When you know how to do something you have knowledge for taking care for something. Knowledge was destroyed twice by a first and a second industrial revolution as proletarianization of manual workers losing their knowing-how during the 19th century, and proletarianization of customers losing their savoir vivre during the 20th century. And the digital revolution is now proletarianizing academic knowledge and sciences - with big data etc. Now I think we have to deproletarianise economy, and to put knowledge at the core of new modes of production and ways of life being the beginning of the real growth ... In the current situation, we are decreasing the capability of people to growth, that is to know how to live by taking care of life. We become more and more dependent on technology. The point is not to de-growth but to develop a new economy that is really producing a new type of investment. This new economy is what I call a growth of negentropy. But the problems for the current economy is that it is only capable to make money with what is purely computable, that is purely entropic. Negentropy is produced by bifurcations. The market is only based on computation, and the systemic bifurcations are never produced by computation. This is the problem.

As for Hans Jonas' considerations, yes, you are right, it is surprising to see that it is possible to discuss such questions in China. But it is not completely surprising. When I was in Nanjing the chancellor of the university told me: The West said it is

impossible to have a Marxist revolution in China because it was not an industrial but a rural society. And you were right, we were not an industrial society. But now we are and now that transformation will happen. Of course, we have to be careful interpreting such discourse. But I think the statement is interesting and relevant because today there is a very critical situation on the geopolitical level in which you have a society, the United States of America, that is capable of controlling everything with a technology that is in itself entropic, which means: condemned to insolvency. Because entropy is creating an enormous insolvency. On the other side you have a country like China with enormous quantity of disposable money and capacity for investment, who is the main shareholder and banker of the United States. So I think there is a very interesting techno geopolitical question: How to find here the possibility of creating a new stage of the digital. We will not find such a possibility in the United States, even if I know many people in the U.S. who would be very positive about such a change and who believe in its necessity. But in the U.S. it is now too late. Because you have stakeholders who have a competitive advantage they don't want to lose. They cannot work this new type of business, the negentropic model, I believe, because behind them are shareholders who then won't make money. The transformation of Google to Alphabet is a symptom of this. The American economy has very big constraints. I don't believe that they are really capable of producing the new stage of the digital.

The digital is reaching a limit. This limit is expressed and reached by the big data as they increase the level of entropy into noetic life and systems, such as for example language, as shown by Frederic Kaplan [*"Linguistic Capitalism and Algorithmic Mediation"*, *Representations* 27 (2014), 57-63] regarding the linguistic capitalism of Google, that eliminates exceptions that are the origin of evolutions of language. This is what Chris Anderson's *"The end of theory"* is incapable to understand. The computational conception of cognition is a new metaphysics of capitalism. In the United States you have very important economic and political agencies that have enormous possibilities for intervention but they don't have the technological perspectives

in order to act properly. I believe it is possible to do things with China on this question. But I work also with other people — English, Italian, German — and try to create a world-wide consortium about this through the digital studies network. There is a new dynamic for addressing the question of the anthropocene, which is the actual topic we are discussing here.

RS: The belief in computation as a new metaphysics of capitalism! One may also call it - especially the theory of singularity as made fashionable by Ray Kurzweil - a new grand narrative in a paradoxical, non- or post-human Hegelian sense: The Spirit becomes self-aware in the form of artificial intelligence, the journey of human consciousness is fulfilled once it is given, passed on to machines. Would such extension of intelligence be the “purpose in nature” that Kant assumes behind the seemingly non-rational, aimless purpose and actions of men? And would this be — in case this development leads to mankind’s extinction or suppression — the final destiny and inevitable providence of reason behind a seemingly unreasonable advancement? However, the question at hand is the relationship of such a technological telos to political or cultural systems. You seem to link the obsession with computation to Western capitalism and expect an alternative approach from the East. I assume that, when the chancellor of the University of Nanjing stated that now that China is industrialized transformation will happen, he didn’t mean a Marxist revolution or at least socialist reformations. This assumption raises a question: The short-termism, that you claim needs to be overcome, is not only a phenomenon of the economy but also of contemporary culture as Douglas Rushkoff’s 2013 book *Present Shock* demonstrates, and as Zygmunt Baumann pointed out already back in the late 20th century when he described the episodic rather than narrative identity of the modern individual who is wary of long-term commitments and “abolishes time in any other form but a flat collection or an arbitrary sequence of present moments; a *continuous present*.” The ontogenetic short-termism somehow mirrors the end of grand narratives on the phylogenetic level: The Western world lacks the teleological

notion (or: grand narrative) to be on its way to a better society (if we ignore the mantra from Silicon Valley Start Ups and their like that their apps, platforms, and services constantly create a better world). In your book *Uncontrollable Societies of Disaffected Individuals: Disbelief and Discredit* (2012, French 2006) you describe the “spiritual misery” that capitalism generates as “disappearance of every horizon of expectation and of all belief, whether religious, political, or libidinal”. One may think: to the extent that contemporary China holds on to such a teleological notion or grand narrative it may be able to orient peoples’ lives in longer terms. But is modern China still committed to such a cause? Is it able to produce, with its communist underpinnings, the “new spirit of capitalism” that you hope for in your book *The Re-enchantment of the World: The Value of Spirit Against Industrial Populism* (2014, French 2006)? Or is it, with its aggressively growing economy and reckless culture of consumption, yet another form of short-termist, runaway capitalism or, as you call it, a “drive-based organization of capitalism”?

BS: I don’t think I am equipped to interpret the relationship between industrialisation and Marxism in China. Personally I don’t believe the question is a Marxist revolution. I don’t agree with what is called Marxism even in the sense of Marx himself. But I believe that in Marx, for example in the *Grundrisse*, you can find something else extremely important concerning automation and mechanical knowledge etc. I believe that the future belongs to those who are capable of producing a new theory of becoming and of creation of bifurcations into becoming creating futures, and I believe that new theory will not come from neo-liberalism. Because the reality of those theories is to ensure the efficiency of computation and the overcome of computation is bifurcation. I believe those theories will especially come out of Asia - but also of other countries everywhere in the world. Because Asia is, precisely, a long-term civilization. Of course, you are right, if you go to Beijing, Tokyo, Seoul, or Hong Kong, it is absolutely consumerist behavior that you will see. But I don’t think at all that the change comes from the masses. I think the change comes

from contradictions in the system. I also believe, the change in the Web that I referred to before is precisely based on the re-functionalisation of the digital differed time with the real time. It is a question today precisely of the reorganization of the digital. And it is in the interest of Asia and Europe to part ways with the Californian model of networking. And I think this is possible. There are very good thinkers and engineers in Europe. Europe and Asia will have to find a kind of agreement. Maybe they will not find it. I would even say, probably they will not find it. But if they don't, it will be a catastrophe. It will be a military and ecological catastrophe. We have no chance. My job is to create this opportunity, not against the United States of course, but from the point of view of China, Japan, Russia etc. it is a question not only of competition but opposition to the U.S. This is for Europe another question. We have to find rational ways to avoid these conflicts. I think this is possible. It is improbable, extremely improbable. But it is not absolutely impossible.